

Road Tanker Loading and Unloading

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The process of loading and unloading road tankers can potentially be hazardous. A thorough understanding of the materials and location via a risk assessment can help minimise the risks.



Road Tanker Loading and Unloading



Introduction

Road tankers are used to load and unload a variety of materials to silos, tanks, bullets, spheres, drums and other tankers. During this 'change of state', there is the potential for a release, fire, explosion, environmental event, damage or injury.

As with all potentially hazardous activities, specific material and activity risk assessments need to be completed and appropriate control measures implemented.



Materials Involved

Specific consideration should be given to the material or materials involved at filling or emptying stations, including:

- Its physical characteristics at the expected temperature and pressures within the tanker
- Its physical characteristics if it were released at different atmospheric conditions, for example in the middle of summer compared to winter
- Whether it is a liquid, a gas or a solid
- Whether it is explosive, flammable or toxic
- If it creates static
- If its transfer is likely to cause erosion or corrosion to the transfer network

Location and Topography

When considering the location of vessel filling or emptying stations as part of any assessment, an examination should be carried out of where the vehicle is parked to load or unload, including the:

- Nature of the surface and its porosity
- Gradient of the surface (the surface should be firm and level)
- Distance of the station from exposed assets including buildings, tanks, and equipment
- Distance from any pumps or control features
- Transport or individuals passing by, or in close proximity
- Drains or sewers near by
- Rivers or streams exposed
- Nature of the surrounding areas, for example, commercial, industrial or natural

Environmental Conditions

Materials behave completely differently with different atmospheric and environmental conditions. Risk assessments need to include the maximum and minimum expected:

- Wind conditions
- Temperature
- Rainfall
- Snow
- Humidity

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Precautions and Controls

The precautions and controls in place should be based on as many different variables as possible. It is unrealistic to assume that loading and unloading activities will always run normally, or that systems will not fail or break down.

The most important thing is to ensure that the layers of controls and precautions are consistent and joined-up.

Issues to consider include:



- Appropriate process controls and hardwired interlocks
- Suitably located emergency manual shutdown buttons, with all necessary safety equipment available at the loading or unloading area
- Containment for at least 110% of the capacity of the largest tank in a bund or 25% of their total storage capacity, whichever is the greater
- Barrier walls or fire compartment walls
- Physical restraints to prevent vehicle movement
- Connecting piping of appropriate length and condition
- Earthing and bonding straps
- The time of loading and unloading activities, ensuring they are always completed by trained personnel in attendance
- Ensuring that road tanker drivers are:
 - fully trained
 - provided with safety instructions
 - wearing appropriate Personal Protective Equipment (PPE) whilst on site and during the loading or unloading process
- Appropriate inspection, testing and maintenance activities with formal records for all items in the process, including the vehicle
- The use of appropriately rated devices, equipment, vehicles, clothing and footwear for classified areas (with a flammable or explosive atmosphere)
- The banning of smoking and other sources of heat near to the operation
- The use of temporary barriers to prevent vehicle or personnel movements
- Clearing overhead obstructions
- Clear and appropriate signage, with relevant information displayed at each loading or unloading point
- Drain covers
- Appropriate lighting, covering the whole of the loading or unloading area and the vehicle
- Any exposed assets and buildings (including open windows or doors)
- Preventing other activities from being completed at the same time as these operations
- Housekeeping, vegetation growth and waste control should be maintained to the highest standards

Training

All individuals involved in the loading and unloading process must be competent to undertake the role and responsibility required of them. Training for 'change' operations involving potentially hazardous materials is essential, and should cover:

- What is normally expected to happen
- What could happen in a number of emergency situations
- How people are expected to respond
- Own personnel and contractors or third parties
- Hazards associated with the substances being loaded or unloaded

Emergency Response

Appropriate formal emergency response plans should be in place for loading and unloading activities. These should consider what could fail, what could go wrong and how it could escalate. The plan should be practised at least annually and ideally involve the local public resources and any third-party organisations or contractors that are used.

Checklist

A generic Road Tanker Loading and Unloading Checklist is presented in Appendix 1 which can be tailored to your own organisation.

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Sources and Useful Links

- [HSG176: Storage of flammable liquids in tanks](#) – Health and Safety Executive (HSE)
- [L122: Unloading petrol from road tankers: Approved Code of Practice and Guidance](#) – HSE

Additional Information

Relevant Loss Prevention Standards include:

- Emergency Response Teams
- Assessment of Pollution Risks

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at riskadvice@aviva.com or call 0345 366 6666.*

*Calls may be recorded and/or monitored for our joint protection.

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Appendix 1 – Road Tanker Loading and Unloading Checklist



Location	
Date	
Completed by (name and signature)	

	Road Tanker Loading and Unloading	Y/N	Comments
1.	Have specific hazard and activity risk assessments been completed and are these regularly reviewed?		
2.	<p>Are the physical characteristics of the material or materials involved fully understood?</p> <ul style="list-style-type: none"> • At the expected temperature and pressures within the tanker or storage vessels? • If it were released at expected worst- and best-case atmospheric conditions? • Is it a liquid, gas or solid? • Is it explosive, flammable or toxic? • Does it create static? • Is it likely to cause erosion or corrosion to the transfer network? • Is it water miscible? • If a gas or a vapour is generated, is it heavier than air? 		
3.	<p>If multiple different materials are loaded or unloaded from the same station, are any materials reactive or incompatible with each other?</p> <p>Are appropriate precautions taken to minimise the materials from interacting?</p>		

	Road Tanker Loading and Unloading Contd.	Y/N	Comments
4.	<p>Does the nature of the tanker loading and unloading station increase the risk posed, due to:</p> <ul style="list-style-type: none"> • Nature of the surface and its porosity? • Gradient of the surface? • Distance from exposed assets including buildings, tanks, and equipment? • Distance from any pumps or control features associated with the activity itself? • Other transport passing by or in close proximity? • Being in a roadway? • Other loading and unloading stations? • Drains or similar nearby? • Rivers or streams nearby? • Nature of the surrounding areas? • Any overhead obstructions? 		
5.	<p>Does the activity expose assets and/or buildings, including:</p> <ul style="list-style-type: none"> • Open windows or doors? • Ventilation air intake vents? 		
6.	<p>When considering the nature of the material and the location of the activity, do the risk assessments include the maximum and minimum expected:</p> <ul style="list-style-type: none"> • Wind conditions? • Ambient temperature? • Rain fall? • Snow or ice? • Humidity? 		
7.	<p>Are there appropriate process controls and hardwired interlocks?</p>		
8.	<p>Have emergency manual shutdown buttons been located in two (2) readily accessible and safe locations?</p> <p>Are alarms or warning indicators clearly labelled and regularly checked?</p>		

	Road Tanker Loading and Unloading Contd.	Y/N	Comments
9.	If a liquid or a solid, has containment been provided for at least 110% of the capacity of the largest container or 25% of their total storage capacity, whichever is the greater?		
10.	Do barrier walls or fire compartment walls need to be provided around the activity, or between it and any exposures?		
11.	Aside from any interlocks on the vehicle, are physical restraints used to prevent vehicle movement?		
12.	Are connecting hoses or piping of appropriate length and condition, and are these formally inspected and maintained? Are couplings, hoses and seals regularly examined to ensure compatibility, and to check for the presence of dirt before connection?		
13.	If multiple materials are transferred, are separate hoses for each material used, and are they easily identifiable and labelled?		
14.	Are earthing and bonding straps provided? <ul style="list-style-type: none"> • Are these interlocked to prevent material transfer? • Are there earth continuity indicator lights? • Is this formally inspected, tested and maintained? 		
15.	Are activities always completed by trained site operators and road tanker drivers? Are all road tanker drivers provided with site induction training?		
16.	Are formal recorded inspection, testing and maintenance activities completed for all items in the process, including the vehicle?		
17.	If the area is classified, are appropriately rated devices, equipment, vehicles, clothing and footwear used? Is this monitored and audited?		
18.	Are temporary barriers used to prevent vehicle or personnel movements?		

	Road Tanker Loading and Unloading Contd.	Y/N	Comments
19.	Is there clear and appropriate signage throughout the site and at the loading and unloading points?		
20.	If there is the potential for materials to enter drains, are appropriate covers used? What about for an emergency release?		
21.	Is there appropriate lighting, including emergency lighting?		
22.	Are other activities prevented from being completed at the same time as these operations, such as: <ul style="list-style-type: none"> • Hot work or other permit-related activities? • Vehicles driving past? • Other loading or unloading if there are adjacent stations? Especially important if they involve incompatible or reactive materials.		
23.	Are housekeeping, vegetation growth and waste control maintained to the highest standards? Is this all maintained away from loading and unloading activity?		
24.	Are there formal training programmes in place for: <ul style="list-style-type: none"> • What is normally expected to happen? • What could happen in a number of emergency situations? • How people are expected to respond? • Both own personnel and contractors or third parties? 		
25.	Has appropriate volatile organic content detection been provided for any organic liquids or gases handled?		
26.	Has appropriate toxic material detection been provided?		
27.	If more than one material is transferred, have all physical characteristics been considered for the detection systems?		
28.	Is appropriate automatic fire detection provided?		

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	Road Tanker Loading and Unloading Contd.	Y/N	Comments
29.	Where any detection is installed, have interlocks been provided to safely and automatically shut down material transfers?		
30.	If there is concern for gas or vapour escape, have automatically and/or manually activated water curtains or water sprays been provided to knock down or absorb such materials?		
31.	Have automatically actuated sprinkler or deluge systems been provided to extinguish any potential fires, including: <ul style="list-style-type: none"> • Material fire? • Vehicle fire? 		
32.	Has exposure protection been provided for any other assets or buildings nearby?		
33.	If there is potential for a release or a pool fire within a contained area, has appropriate foam or foam blanketing been provided?		
34.	Are there monitor nozzles or water cannons?		
35.	Are there appropriate fire hydrants in the area, with at least two located in opposite directions? Is the available water supply known and considered acceptable?		
36.	Are formal emergency response plans in place? Do these consider: <ul style="list-style-type: none"> • What could fail? • What could go wrong? • How it could escalate? 		
37.	Are emergency plans practised at least annually?		
38.	Do emergency plans involve: <ul style="list-style-type: none"> • Local public resources? • Any contractors or third-party delivery organisations? 		
39.	Additional comments:		

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